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(58) Field of search

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(54) Improvements in or relating to extractors

(57) An extractor comprises a housing (1) having an inlet (2) at the bottom thereof for receiving fumes and an outlet (6) at the top thereof for discharging fumes, a spray nozzle (15) disposed in the housing (1) for spraying cleaning solution into the path of the fumes, a rotary baffle (8) disposed in the housing (1) for recovering cleaning solution and entrained matter from the fumes, and a filter (14) disposed between the spray nozzle (15) and the baffle (8). A further spray 17 for supplying cleaning solution directly to the baffle (8) is provided.

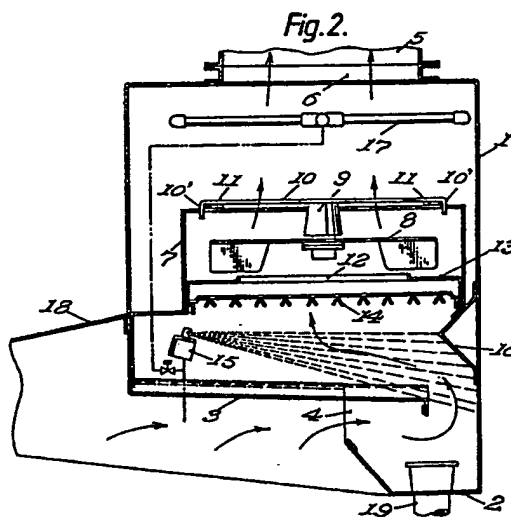


Fig.1.

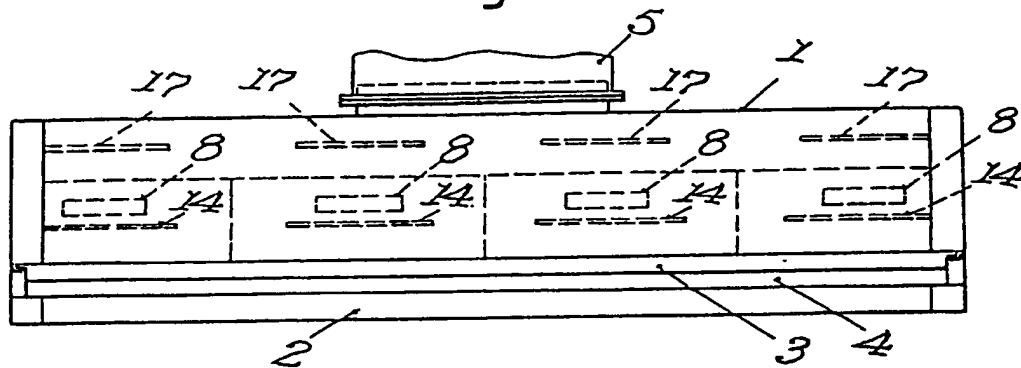
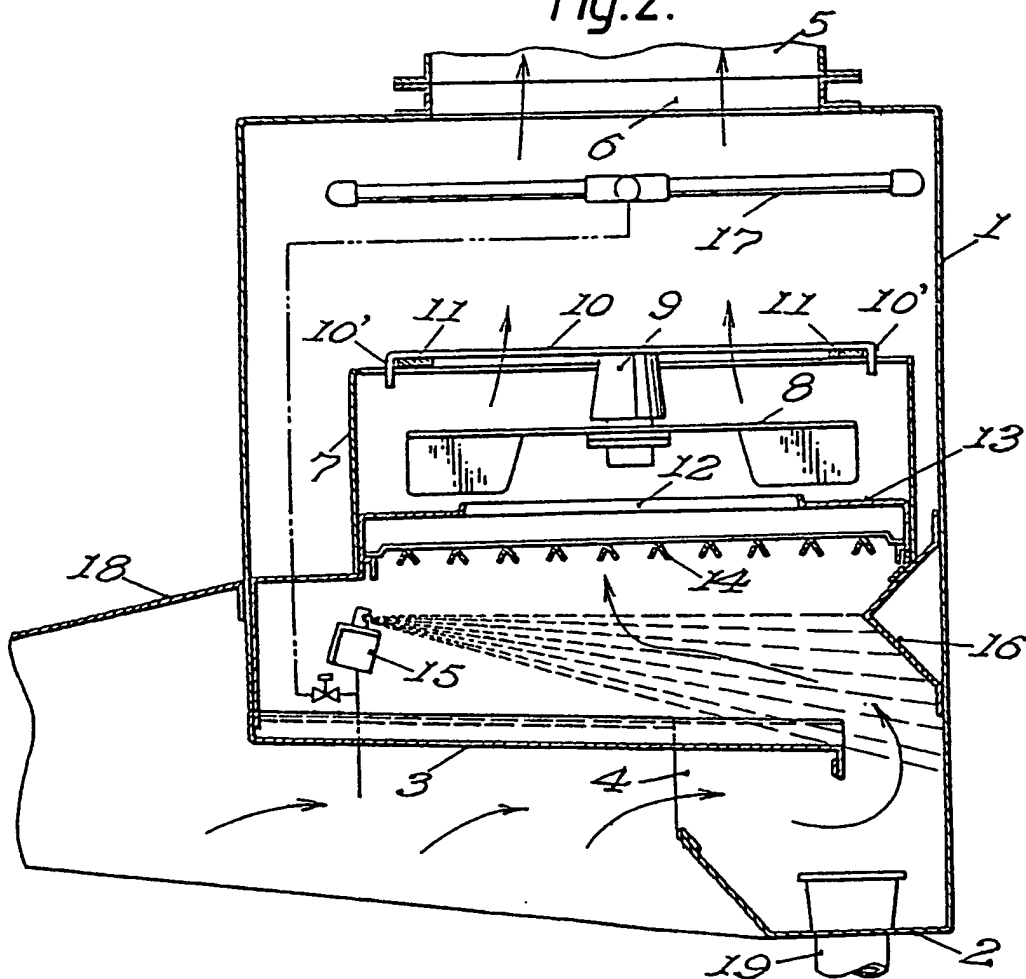


Fig.2.



SPECIFICATION

Improvements in or relating to extractors

5 THIS INVENTION relates to improvements in or relating to extractors and, in particular, to an extractor for cleaning and discharging into the atmosphere hot exhaust air containing smoke, oils and fats emitted during use of ranges, fryers and other heat-generating cooking appliances.

10 In a previously proposed extractor, cleaning solution is sprayed into hot air entering a housing through an inlet formed in the bottom of the housing to entrain dust, oils and fats, and the water, oils and fats are then eliminated by means of a rotary baffle disposed above the inlet. The hot air is discharged through an outlet at the top of the housing into a duct which communicates with the atmosphere. An extractor fan disposed in the duct draws air through the extractor and discharges the same into the atmosphere.

20 However, spraying cleaning solution into the hot exhaust air is not adequate completely to remove water, oils, and fats. In previously proposed extractors, therefore, a small amount of such foreign substances remains deposited on the surface of the rotary baffle even if the centrifugal effect of the rotary baffle is employed to remove such foreign substances. As a result, the operation of the rotary baffle is obstructed after a comparatively short period of time and a small amount of foreign substances may be discharged into the atmosphere with the exhaust air.

30 It is an object of the present invention to enable the provision of an extractor whereby the above disadvantages may be overcome or at least mitigated.

35 Accordingly, the present invention provides an extractor for extracting and cleaning fumes generated during use of a cooking appliance, which extractor comprises a housing having an inlet for receiving fumes and an outlet for discharging fumes, a spray nozzle disposed in the housing for spraying cleaning solution into the path of the fumes, means disposed in the housing for recovering cleaning solution from the fumes and means disposed between the spraying nozzle and the recovering means for filtering the fumes.

45 Thus, a preferred extractor in accordance with this invention is provided with a filter which is located between a cleaning solution spraying means and a rotary baffle so that a certain proportion of oils, fats and water is removed from the hot exhaust air before it is centrifuged by the rotary baffle. These features reduce contamination of the rotary baffle and eliminate nearly completely foreign substances from the exhaust air discharged into the atmosphere.

55 For a better understanding of the present invention, and to show how the same may be put into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

60 FIGURE 1 is a front elevational view of an extractor in accordance with the invention, and

FIGURE 2 is an enlarged side-sectional view of the extractor of Figure 1.

The extractor housing 1 is of a flow and box-like shape. A drain gutter is provided at the bottom and to the rear of the housing 1. A baseplate/inspection door 3, which can be freely slid back and forth, extends from the bottom front end towards the bottom rear end of the housing 1 above the drain gutter 2, sloping downwards towards the rear housing 1. An inlet 4 is provided above and in front of the drain gutter 2, and an outlet 6 is provided at the top of the housing 1 to connect the same to a duct 5.

A guide frame 7 is provided inside the housing 1 so that an air passage is created to transfer hot exhaust air from a lower to an upper cavity. Inside the guide frame 7, a rotary baffle 8 is mounted. The shaft of the rotary baffle 8 is inserted into a bearing 9 which is fastened to a mounting plate 10. Both ends of the mounting plate 10 are placed on respective frames 11 attached to the guide frame 7. Also, both ends of the mounting plate 10 are bent at 10° to prevent transverse displacement and rotation thereof so that the rotary baffle 8 is correctly mounted, permitting removal thereof.

85 A partition plate 13, in which a vent hole 12 is made, is provided beneath the rotary baffle 8. Under the partition plate 13, a filter 14 comprising grid or mesh type plates is mounted in such a manner as to allow removal thereof.

90 A spray nozzle 15 is installed under the filter 14 to spray an aqueous solution of detergent across the lower cavity to clean hot exhaust air coming into the body 1 via the inlet 4 above the drain gutter 2, by removing dust, oils and fats, and other foreign substances. An angular cleaning-solution reflector 16 is attached to a rear panel of the housing 1. The reflector plate 16 faces towards the spray nozzle 15 and directs the sprayed cleaning solution down into the drain gutter 2.

100 A shower-type cleaning nozzle 17 is installed above the rotary baffle 8 inside the housing 1 to inject cleaning solution downwards. The cleaning solution is injected as required so that the rotary baffle 8, guide frame 7 and other relevant components are cleaned.

105 A hood 18 is installed at the base of the housing 1, and a drain pipe 19 is connected to the drain gutter 2. In cases where the extractor is wide as shown in Figure 1, (for example to service a number of cooking appliances placed side by side) a number of rotary baffles 8 and attachments such as filters 14, spray nozzles 15 and cleaning nozzles 17 are installed.

When the extractor is installed above a range or other heat-generating cooking appliance and the extractor fan inside the duct 5 is actuated, hot exhaust air coming out from the cooking appliance and utensils is sucked up into the housing 1 via the inlet 4 and an inlet above the drain gutter 2. While the spray nozzle 15 directs a jet of cleaning solution into the incoming hot exhaust air, a large proportion of the foreign substances present is removed. When the exhaust air passes through the filter 14, the remaining foreign substance is eliminated. That is, the exhaust air is considerably cleaned and cooled before reaching the rotary baffle 8. As a result, contamination of the

rotary baffle 8 is minimized and its efficiency of rotation is maintained even after long periods of service.

The rotary baffle 8 rotates while the extractor fan in the duct 5 operates to cause a forced updraft of exhaust air. While in rotation, the rotary baffle 8 centrifuges the rising exhaust air to eliminate the remaining oils, fats and water or pick up the same on its blades.

After being cleaned of oils, fats and water in the above manner, the exhaust air is introduced into the duct 5 via the outlet 6 and discharged into the atmosphere as clean air.

To eliminate foreign substances which are deposited on the rotary baffle 8, guide frame 7 and other relevant parts of the extractor after prolonged periods of use, the cleaning nozzle 17 is used as necessary to inject cleaning solution over the above-mentioned components and parts. Also, the rotary baffle 8 can be removed from the guide frame 7 for cleaning or other maintenance purposes as required. Furthermore, the filter 14 can be removed and cleaned if required.

When the filter 14, rotary baffle 8 or other component is to be inspected for cleanliness, the baseplate/inspection door 3 is pulled out to gain access to the lower cavity of the housing 1 so that the components can be inspected with ease. With the baseplate/inspection door 3 pulled out, it is possible to take out the filter 14, partition plate 13, rotary baffle 8, and other accessible parts.

The cleaning solution, which is contained in a tank that permits the adjustment of cleaning solution concentration, is pumped to the spray nozzle 15 and cleaning nozzle 17. If foreign substance deposits are stubborn, the cleaning solution concentration is increased as necessary. The washings are discharged into the drain pipe 19 via a strainer; heavily contaminated washings are discarded but those which are still usable are circulated for reuse.

During normal operation, the extractor is placed under the control of a timer which is set continuously to switch between two modes, that is, short-term fresh cleaning solution supply and long-term circulation, to ensure constant, proper supply of cleaning solution to the spray nozzle 15.

In summary, a filter 14 is installed under a rotary baffle 8 so that remaining oils and fats and a large quantity of water are removed from hot exhaust air rising through a spray of cleaning solution. Therefore, the exhaust air is considerably cleaned before it reaches the rotary baffle 8. As a result, contamination of the rotary baffle 8 is reduced so that it delivers its full expected performance for long periods of time. Furthermore, the rotary baffle 8 eliminates oils, fat and water nearly completely from the exhaust air, making it possible to discharge sufficiently clean, dry exhaust air into the atmosphere via a duct 5.

CLAIMS

1. An extractor for extracting and cleaning fumes generated during use of a cooking appliance, which extractor comprises a housing having an inlet for receiving fumes and an outlet for discharging fumes, a spray nozzle disposed in the housing for spraying cleaning solution into the path of the fumes, means disposed in the housing for recovering cleaning

solution from the fumes and means disposed between the spraying nozzle and the recovering means for filtering the fumes.

2. An extractor according to Claim 1, wherein the housing is provided with a further opening and a movable door for closing the further opening.

3. An extractor according to Claim 1 or 2, which further comprises a drain for draining cleaning solution from the housing.

4. An extractor according to Claim 3, which further comprises means for returning at least some of the cleaning solution, which has been drained from the housing, to the spray nozzle.

5. An extractor according to Claim 3 or 4, which further comprises a deflector for deflecting cleaning solution, which has been sprayed from the spray nozzle, towards an inlet of the drain.

6. An extractor according to any one of the preceding claims, wherein the means for recovering cleaning solution from the fumes comprises a rotary baffle.

7. An extractor according to Claim 6, wherein the rotary baffle is detachably mounted in the housing.

8. An extractor according to any one of the preceding claims, wherein the filtering means is detachably mounted in the housing.

9. An extractor, substantially as hereinbefore described with reference to, and as shown in, the accompanying drawing.

10. Any novel feature or combination of features described herein.

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